

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**  
**Office of Commercial Space Transportation**

**Adoption of the Environmental Assessment**  
**and**  
**Finding of No Significant Impact**  
**For Boeing Starliner Reentry and Recovery at the U.S. Army White**  
**Sands Missile Range**

**Summary**

The National Aeronautics and Space Administration (NASA) acted as the lead agency, and the Federal Aviation Administration (FAA) was a cooperating agency, in the preparation of the June 2019 *Commercial Crew Transportation System Environmental Assessment for the Boeing Starliner Launch from Cape Canaveral Air Force Station and Landing and Recovery at the U.S. Army White Sands Missile Range* (WSMR) (EA), which analyzed the potential environmental impacts of the Boeing Corporation's (Boeing) proposal to land the Commercial Crew Transportation System Starliner (Starliner) at WSMR in New Mexico. The U.S. Army also served as a cooperating agency. The EA was prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA; 42 United States Code [U.S.C.] § 4321 et seq.); Council on Environmental Quality NEPA implementing regulations (40 Code of Federal Regulations [CFR] parts 1500 to 1508); 32 CFR Part 651, *Environmental Analysis of Army Actions*; the Procedures of Implementation of NEPA for NASA (14 CFR part 1216); the NASA Procedural Requirement (NPR) for Implementing NEPA and Executive Order 12114 (NPR 8580.1); and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. NASA issued a Finding of No Significant (FONSI) based on the EA on July 18, 2019.

NASA and Boeing requested that WSMR support the testing and development of the Starliner as part of NASA's Commercial Crew Development initiative. The Starliner is a spacecraft system designed to affordably, reliably, and safely transfer crew from the Earth's surface to orbiting space complexes in low earth orbit, including the International Space Station, and return them safely back to Earth. WSMR is a

U.S. Department of Defense major range and test facility with headquarters located approximately 25 miles east of Las Cruces, New Mexico. The range possesses unique characteristics necessary for the U.S. Army, U.S. Navy, U.S. Air Force (USAF), NASA, and other federal and commercial entities to conduct safe, large-scale experiments on advanced weapons and space flight systems. WSMR covers approximately 3,200 square miles in south-central New Mexico.

Boeing is also considering reentry site locations at 1) U.S. Army Dugway Proving Ground in Utah, 2) U.S. Army Willcox Range in Arizona, and 3) Edwards Air Force Base in California. Because reentry operations at each of these sites has independent utility (i.e., reentry operations at the sites are not connected temporally or spatially), NASA and the Department of Defense are preparing individual EAs for each of the proposed reentry sites. The FAA is a cooperating agency on each of the EAs. Therefore, the FAA is assessing the potential environmental consequences of issuing reentry licenses to Boeing for Starliner reentry operations at each proposed site individually. As appropriate, the FAA will adopt each EA and issue individual FONSI to support its environmental review associated with issuing Boeing reentry licenses for Starliner reentry operations at the proposed sites.

The Starliner would be launched into space atop the United Launch Alliance's (ULA) Atlas V rocket from Cape Canaveral Air Force Station (CCAFS) Launch Complex 41 (LC-41). The EA states that the FAA's anticipated actions of issuing ULA a launch license for Atlas V launch operations at LC-41 and issuing Boeing a reentry license for Starliner reentry operations at WSMR are considered part of the action analyzed in the EA. Several NEPA documents have been prepared that analyze the potential environmental consequences of Atlas V launches at LC-41, including the 1998 U.S. Air Force (USAF) Final Environmental Impact Statement for the Evolved Expendable Launch Vehicle Program and 2000 Final Supplemental Environmental Impact Statement for the Evolved Expendable Launch Vehicle Program. The FAA was a cooperating agency on both Environmental Impact Statements (EISs) and formally adopted them to support issuing launch licenses to vehicle operators for launch operations described in the EISs. At the time the 1998 and 2000 EISs were prepared, Starliner reentry was not anticipated, and thus was not included in the analyses. In 2018, as part of the environmental review for evaluating ULA's launch license application for Atlas V launches at LC-41, the FAA prepared a Written Re-evaluation (WR) of the EISs. The WR concluded that the contents of the EISs remained current and substantially valid and the decision to issue a launch license to ULA for Atlas V launches from LC-41 did not require the preparation of a new or supplemental EA or EIS. The FAA issued ULA a license on June 1, 2018, and the license expires on May 31, 2023. This license authorizes ULA to conduct Atlas V launches at LC-41 with payloads,

including the Starliner. The 1998 and 2000 EISs are incorporated by reference in the EA and this FONSI. Thus, the EA and this FONSI focuses on the potential environmental consequences of Starliner reentry operations at WSMR and does not discuss in detail Atlas V launch impacts.

Boeing is required to obtain a reentry license from the FAA for Starliner reentry and landing activities at WSMR. Based on its independent review and consideration of the EA, the FAA issues this FONSI concurring with, and formally adopting, the analysis of impacts and findings in the EA to support the FAA's issuance of a reentry license to Boeing for Starliner reentry and landing activities at WSMR. If, in their license application to the FAA, Boeing makes changes to their operations which fall outside the scope of the EA, additional environmental review would be required prior to the FAA issuing a reentry license.

After reviewing and analyzing available data and information on existing conditions and potential impacts, including the EA, the FAA has determined the issuance of a reentry license to Boeing for Starliner reentry and landing activities at WSMR would not significantly affect the quality of the human environment within the meaning of NEPA. Therefore, the preparation of an Environmental Impact Statement is not required, and the FAA is independently issuing this FONSI. The FAA has made this determination in accordance with applicable environmental laws and FAA regulations. The EA is incorporated by reference into this FONSI.

For any questions or to request a copy of the EA, contact:

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## **Purpose and Need**

The purpose of FAA's Proposed Action is to fulfill the FAA's responsibilities as authorized by the Commercial Space Launch Act (51 U.S.C. Subtitle V, ch. 509, §§ 50901-50923) for oversight of commercial space launch activities, including licensing launch activities. The need for FAA's Proposed Action results from the statutory direction from Congress under the Commercial Space Launch Act, 51 U.S.C 50901(b) to, in part, "protect the public health and safety, safety of property, and national

security and foreign policy interests of the United States” while “strengthening and [expanding] the United States space transportation infrastructure, including the enhancement of United States launch sites and launch-site support facilities, and development of reentry sites, with Government, State, and private sector involvement, to support the full range of United States space-related activities.”

## **Proposed Action**

The FAA’s Proposed Action is to issue a reentry license to Boeing for Starliner reentry and landing activities at WSMR. The EA analyzed an initial two test landings starting in 2019 and then up to two landings per year thereafter. The EA analyzed two proposed landing sites at WSMR: a northern site (WSMR-649) and a southern site (White Sands Space Harbor [WSSH]). The Starliner would nominally land within a circle with a radius of approximately 1.5 kilometers (km). To allow for possible wind dispersions, a 4 km radius circle would be established that provides a relatively flat surface free of any buildings or above-ground obstructions that could cause a hazard to the landing spacecraft. Several pieces jettisoned during the landing sequence would land outside the 4-km circle within a landing zone approved by WSMR.

In addition to reentry and landing operations, the EA analyzed the potential environmental consequences of the U.S. Army demolishing a small number of abandoned buildings, burying or relocating power lines, and clearing vegetation and grading terrain within the 4-km landing zones at WSMR-649 and WSSH. The U.S. Army has already completed these activities. The FAA has no action associated with these activities. Therefore, these activities are not addressed in this FONSI.

In order to ensure all the pieces of the Starliner land within the approved landing zone, Boeing would establish wind limits and include them as reentry criteria in its license application. If the weather data show an exceedance of the limits, Boeing would decide to either attempt a landing at a back-up landing site<sup>1</sup> (assuming it has favorable weather) or wave off the landing to a later opportunity when conditions are favorable.

## **Alternatives**

Alternatives analyzed in the EA include (1) the Proposed Action and (2) the No Action Alternative. Under the No Action Alternative, Boeing would not conduct Starliner reentry and landing operations at WSMR.

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<sup>1</sup> Back-up landing sites are analyzed in other EAs.

Thus, the FAA would not issue Boeing a reentry license for Starliner reentry and landing operations at WSMR. The No Action Alternative would not meet the purpose and need.

## **Environmental Impacts**

The following presents a brief summary of the potential environmental impacts considered in the EA for the Proposed Action. This FONSI incorporates the EA by reference and is based on the potential impacts discussed therein. The FAA has determined the analysis of impacts presented in the EA represents the best available information regarding the potential impacts associated with the FAA's regulatory responsibilities as described in this FONSI.

The EA's Starliner reentry and landing analysis dismissed detailed analysis of potential impacts to coastal resources, farmlands, and floodplains because these resources are not present at the proposed landing sites and thus the Proposed Action would not affect them. Additionally, natural resources were dismissed from detailed analysis because the Proposed Action would not result in the development of new facilities or result in consumption of natural resources other than the fuel used by the recovery vehicles (e.g., trucks) during reentry operations.

## **Air Quality**

Per FAA Order 1050.1F, air quality impacts are considered significant if the action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the Environmental Protection Agency under the Clean Air Act, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations. WSMR is located in an attainment area. The Starliner lands via parachutes. No propulsion jet firings take place below approximately 30,000 feet altitude. During the landing operations, air emissions would be generated from vehicle and portable generator combustion, man-made dust, and, should a failure occur, fluid release from the Starliner (hydrazine or ammonia) or recovery vehicles (coolant, diesel or gasoline). However, only small quantities of emissions would be generated during these short events. Dust control measures would be used as necessary. Due to the short duration of the landing activities, no air quality standards (including the NAAQS) would be exceeded and thus no significant air quality impacts would occur [EA 5.1.2 at 17].

## **Biological Resources (including Fish, Wildlife, and Plants)**

Jettisoned hardware would be collected as efficiently as possible to minimize the impact to vegetation and wildlife. Wildlife could be affected by Starliner landing activities and noise. Wildlife populations would not be significantly impacted because reentry operations are very short term in nature. Species protected by the Endangered Species Act (ESA) are not known to occur at the landing sites. The Proposed Action would have no effect on ESA-listed species. Therefore, the Proposed Action would not result in significant impacts to biological resources [EA 5.2.2 at 29].

## **Climate**

Reentry of the Starliner would not generate greenhouse gas (GHG) emissions. The Starliner lands via parachutes. The landing operations would be short term in nature and would occur infrequently. Thus, the contribution of GHG emissions to global climate change would be negligible. In addition, climate change would not affect the Proposed Action or exacerbate any of the potential effects caused by the Proposed Action. The Proposed Action would not result in significant climate-related impacts [EA 5.3.2 at 30].

## **Department of Transportation Act, Section 4(f)**

The Proposed Action would not result in a physical or constructive use of any Section 4(f) property. WSMR Flight Safety would determine the need to close White Sands National Monument during landing operations. If needed, road closures would occur according to the existing agreements between the National Park Service and New Mexico Department of Transportation. Closures would occur a maximum of two times per year and would be short term in duration. Any impacts on public access to the monument would be minimal and not constitute a constructive use of the property. Starliner landings would not be planned for the weekends the Trinity Landmark is open to the public (first weekend of April and October).

The FAA assessed the potential for an effect to a Section 4(f) property resulting from the sonic boom produced during reentry. The sonic boom would occur a maximum of two times per year, would be short term in duration (less than a second), and, while noticeable, would not cause any impacts or damage because of the small magnitude of the overpressure—a maximum of 0.5 pounds per square foot (psf), which is less than a clap of thunder. Based on this assessment, the FAA has determined that the proposed reentry operations would not have the potential to affect any Section 4(f) property.

Therefore, there would be no constructive use of a Section 4(f) property and thus no significant impacts on a Section 4(f) property. Because the FAA finds there would be no physical use or constructive use, there is no requirement to engage in consultation with 4(f) property officials with jurisdiction or make a 4(f) determination (e.g., reach a *de minimis* determination or conduct a 4(f) evaluation).

In summary, the Proposed Action would not result in significant impacts to a Section 4(f) property [EA 5.4.2 at 32].

### **Hazardous Materials, Solid Waste, and Pollution Prevention**

Small amounts of hydrazine may be onboard the Starliner when it lands. In the unlikely event the fuel compartment is ruptured, Boeing would perform immediate clean-up procedures. Solid waste would be generated during landing activities. This waste would be handled and disposed of by Boeing in accordance with applicable federal, state, and WSMR regulations. Biohazard waste could be generated during the astronaut post-landing medical evaluation. This would be removed by the medical team for disposal. Personnel would be trained prior to landing operations and comply with applicable U.S. Army procedures and protocols (e.g., the WSMR Environmental Compliance Handbook, which addresses the mandatory requirements governing the management of hazardous materials and hazardous waste, including WSMR Regulation 200-1, *Hazardous Waste Management*). No significant impacts related to hazardous materials, solid waste, and pollution prevention are anticipated [EA 5.13.2 at 60].

### **Historical, Architectural, Archeological, and Cultural Resources**

The proposed landing areas at WSMR-649 and WSSH have been previously surveyed. No historic properties exist in either of the proposed landing areas. The WSMR-649 site contains three archaeological sites that have been determined not eligible for the National Register of Historic Places (NRHP). The WSSH site, although once identified as an NRHP-eligible historic district, has since been mitigated through a Historic American Engineer Survey and is now abandoned and therefore is no longer a managed historic property.

WSMR operates under a 1985 Programmatic Memorandum of Agreement (PMOA). Under the PMOA and associated Historic Preservation Plan, WSMR responsibly manages its cultural resources under agreed terms and stipulations. The PMOA and Historic Preservation Plan allow WSMR to conduct in-house review of agency undertakings without consultation with the State Historic Preservation Officer (SHPO) if there is no effect to historic properties. Per the surveys conducted at each site, which were

reviewed by the SHPO, there are no historic properties present. Therefore, WSMR has determined that Starliner reentry and landing would not affect historic properties. Should any debris strike or land on any historic properties (recorded or unrecorded), WSMR archaeologists would perform an evaluation of the effect and proceed accordingly, to include notification and consultation with the SHPO.

In summary, the Proposed Action would not result in significant impacts to historical, architectural, archaeological, or cultural resources [EA 5.7.2 at 49].

### **Land Use**

All parts of the Starliner spacecraft would be removed and the landscape left in its original condition to the extent possible. It may not be possible to find all the jettisoned parts due to their small size and the size of the landing zone. These jettisoned items do not pose a significant threat to any area of environmental concern. Overall, the topography, soil, and soil quality would not be significantly affected. The landing operations are typical of activities carried out at WSMR. The Proposed Action would not result in significant impacts to land use [EA 5.5.2 at 34].

### **Noise and Noise-Compatible Land Use**

The noise generated by the vehicles and equipment for landing operations would be short term in nature and not expected to affect the day-night average sound level (DNL) of the area. Reentry operations would occur at most twice a year. Boeing used PCBOOM (an FAA-approved model) to model the sonic boom generated during Starliner reentry. The sonic boom is estimated to have overpressures around 0.5 psf, which is less than a clap of thunder. This equates to a C-weighted DNL (CDNL) of 24 decibels (dB), well below the FAA threshold of 65 dB. No damage would occur from the sonic boom. The Proposed Action would not increase noise by DNL 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe. The Proposed Action would be consistent with existing land use and not result in significant noise impacts [EA 5.8.2 at 51].

### **Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks**

The Proposed Action might provide a very small economic benefit for cities close to WMSR, such as Las Cruces, El Paso, and Alamogordo. This is due to the approximately 24 members of the recovery team that would travel to and spend a week in the area for the landing, the approximately 30 NASA officials

who would spend two days in the area around the landing date, and the small number of Boeing personnel who would travel to WSMR. The additional influx of people would occur up to two times per year. No significant increase or decrease to employment, population, or economic activity is expected from the landing operations. The current level of socioeconomic activity would not significantly change or be adversely affected [EA 5.9.2 at 53].

Direct impacts are not anticipated to extend outside the boundaries of WSMR, with the exception of the sonic boom. Therefore, the Proposed Action would not have disproportionately high and adverse effects on low income or minority populations [EA 5.10.2 at 54]. The U.S. Army controls public access to WSMR and therefore no member of the public would be present around the landing site during landing operations. Therefore, the Proposed Action does not have the potential to lead to a disproportionate health or safety risk to children [EA 5.10.2 at 54].

### **Visual Effects (including Light Emissions)**

The Proposed Action would have a slight impact related to light emissions at the landing sites for those instances where the Starliner is scheduled to land after sunset or late enough in the day that the landing operations would extend past sunset. WSMR portable lighting guidelines would be followed to ensure operations would not attract migrating birds. The Proposed Action would have no long-term impacts on the visual environment. There are no visually sensitive or light-sensitive receptors near the landing sites. Therefore, the Proposed Action would not result in significant visual effects [EA 5.11.2 at 55].

### **Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)**

The Proposed Action would not affect wetlands, floodplains, surface waters, or wild and scenic rivers, as none of these resources are located near the proposed landing sites. No impacts to groundwater would occur. If standing water was present at the landing area, Boeing would select an alternate landing site. Therefore, the Proposed Action would not result in significant impacts on water resources [EA 5.6.2 at 38].

### **Cumulative Impacts**

This FONSI incorporates by reference the EA, which addresses the potential impacts of past, present, and reasonably foreseeable future activities at and within the vicinity of WSMR that would affect the

resources impacted by the Proposed Action. Given the nature of the Proposed Action, the remote location of the proposed landing sites, the small number of proposed landings, and minor direct and indirect impacts on the human environment, the Proposed Action would not result in significant cumulative impacts [SEA 6.2 at 62].

### **Agency Finding and Statement**

The FAA has determined that no significant impacts would occur as a result of the Proposed Action and, therefore, that preparation of an Environmental Impact Statement is not warranted and a FONSI in accordance with 40 CFR Section 1501.4(e) is appropriate.

After careful and thorough consideration of the facts contained herein, the undersigned finds that the proposed federal action is consistent with existing national environmental policies and objectives as set forth in Section 101 of NEPA and other applicable environmental requirements and will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 102(2)(C) of NEPA.

APPROVED:



DATE:

20 Feb 2020

Wayne R. Monteith  
Associate Administrator for Commercial Space Transportation